UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/611,745	06/30/2003	Canan Uslu Hardwicke	121278-1	1348

6147 7590 11/03/2010

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
ONE RESEARCH CIRCLE
BLDG. K1-3A59
NISKAYUNA, NY 12309

EXAMINER	
TUROCY, DAVID P	

ART UNIT	PAPER NUMBER
1715	

NOTIFICATION DATE	DELIVERY MODE
11/03/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ldocket@crd.ge.com
rosssr@ge.com
robertsr@ge.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CANAN USLU HARDWICKE and RONALD SCOTT BUNKER

Appeal 2009-011935
Application 10/611,745
Technology Center 1700

Before BRADLEY R. GARRIS, LINDA M. GAUDETTE, and MELANIE L. MCCOLLUM, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL[1]

---

[1] The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision[2] finally rejecting claims 1-24 and 27, the only claims pending in the Application.[3] We have jurisdiction under 35 U.S.C. § 6(b).

I. BACKGROUND

The invention relates to film cooling of hot gas path components of the type used in aircraft engines and stationary power systems (*see* Spec.[4] [0003]), e.g., a turbine blade (Spec. [0027]). Claims 1 and 17 are representative of the invention and are reproduced below from the Claims Appendix to the Appeal Brief:

> 1. A method for forming a plurality of discrete flow directors on a component comprising a wall having at least one film-cooling hole extending through the wall and defining an exit site, wherein at least one of the flow directors is associated with respective one of the at least one film cooling hole and wherein each of the flow directors comprises a three-dimensional projection disposed external to the cooling hole and having limited dimensions in three directions, said method comprising depositing at least one layer on the wall of the component, wherein said deposition includes shaping the at least one layer in accordance with a predetermined shape to form each of the flow directors that extends outwards from the wall of the component and through hot gas flow path to direct a coolant flowing from the film-cooling hole toward a hot surface of the wall, wherein the flow director does not extend over the exit site.
>
> 17. A method for forming a plurality of discrete flow directors on a turbine component comprising a wall having a cold surface and a hot surface, wherein at least one film-cooling hole extends through the wall for flowing a coolant from the

[2] Final Office Action ("Final") mailed Jan. 16, 2008.
[3] Appeal Brief ("Br.") filed Aug. 4, 2008.
[4] Specification filed Jun. 30, 2003.

> cold surface to the hot surface, the film-cooling hole defining an exit site in the hot surface of the wall, wherein at least one of the flow directors is associated with respective one of the at least one film cooling hole and wherein each of the flow directors comprises a three-dimensional projection disposed external to the cooling hole and having limited dimensions in three directions, said method comprising:
>
> depositing at least one layer on the wall of the component, wherein said deposition includes shaping the at least one layer in accordance with a predetermined shape to form each of the flow directors that extends outwards from the wall of the component and through hot gas flow path to direct the coolant flowing from the film-cooling hole toward the hot surface of the wall, wherein the flow director does not extend over the exit site.

The Examiner maintains (Ans.[5] 3-6), and Appellants request review of (Br. 4-5), the following grounds of rejection[6]:

1. Claims 1-5, 10-20, 23, 24, and 27 under 35 U.S.C. § 102(b) as anticipated by Bunker;[7]

2. Claims 1-5, 10-20, 23, 24, and 27 under 35 U.S.C. § 103(a) as obvious over Bunker; and

3. Claims 6-9, 21, and 22 under 35 U.S.C. § 103(a) as obvious over Bunker in view of Sabol.[8]

---

[5] Examiner's Answer mailed Oct. 6, 2008.

[6] Appellants also state that "[t]here are outstanding amendments to claims 1 and 17 to be considered by the Board." (Br. 2.) Appellants are referring to amendments made in a Response to the Final, filed Mar. 19, 2008. These amendments were not entered by the Examiner. (Advisory Action mailed Mar. 19, 2008.) The Examiner's decision to not enter the amendments is a petitionable matter, i.e., one which is not subject to review by the Board of Patent Appeals and Interferences. *Cf.* 37 C.F.R. § 41.31(a)(1) (Jul. 2008).

[7] US 6,234,755 B1, issued May 22, 2001.

Appellants' arguments are directed to limitations found in independent claims 1 and 17. (*See* Br. 5-9.) Appellants rely on the same arguments in traversing all three grounds of rejection. (*Id.*) Therefore, the dependent claims stand or fall with claim 1 or claim 17.

II. DISCUSSION

We adopt the Examiner's fact finding and reasoning (Final 4-8; Answer 3-12) as our own in affirming all three grounds of rejection. For the sake of completeness, we add the following discussion of the claim interpretation issue raised by Appellants[9], namely:

Did the Examiner reversibly err in finding that the claim limitations pertaining to the shape and position of the flow directors encompass Bunker's slot 74 (*see* FIG. 3, referenced in the Final at 4-5 and the Ans. at 3)?

Appellants' claimed invention is directed to "[a] method for forming a plurality of discrete flow directors on a component." (Claim 1; *see also*, claim 17.) The preambles of claims 1 and 17 further recite: "each of the flow directors comprises a three-dimensional projection disposed external to the cooling hole and having limited dimensions in three directions." Claims 1 and 17 recite a single method step of "depositing at least one layer on the

---

[8] US 6,060,174, issued May 9, 2000.

[9] "Determination that a claim is anticipated under 35 U.S.C. § 102(b) involves two analytical steps: (1) the Board must interpret the claim language; and (2) the Board must then compare the construed claim to a prior art reference and make factual findings that 'each and every limitation is found either expressly or inherently in [that] single prior art reference.'" *Yorkey v. Diab*, 605 F.3d 1297, 1300 (Fed. Cir. 2010) (quoting *In re Crish*, 393 F.3d 1253, 1256 (Fed. Cir. 2004) (quoting *Celeritas Techs. Ltd. v. Rockwell Int'l. Corp.*, 150 F.3d 1354, 1360 (Fed. Cir. 1998) (alteration in original))).

wall of the component." Further limitations on the claimed depositing step are set forth in two successive "wherein" clauses. More specifically, the first wherein clause specifies that "deposition includes shaping the at least one layer in accordance with a predetermined shape to form each of the flow directors." (Claim 1; *see also*, claim 17.)

The term "flow director," as used in the Specification, includes connectors, flow modifiers and ridges. (Spec. [0045].) Flow directors may be formed in a variety of shapes (Spec. [0033] (trapezoidal, triangular, etc.); *see also*, claim 27), and may be positioned on one or more of the lateral, upstream, and downstream sides of the coolant exit holes (Spec. [0036]). The Specification describes forming flow directors by "depositing one or more layers 40 on the [component] wall 12" and then shaping the layer. (Spec. [0045].) One of the layers may be a thermal barrier coating ("TBC"). (Spec. [0046].) The resultant flow director is said to "conform[] to the wall 12 of the component 10." (Spec. [0045].) The Specification does not limit the depositing step to a specific technique, but indicates that deposition may include electron beam physical vapor deposition and include one or more masking steps. (Spec. [0055]; *see also*, claims 15 and 16.)

Bunker FIG. 3 illustrates a wall 60 of a component having a hot surface 62 partially coated with a bond layer 70 and an overlying thermal barrier coating ("TBC") 72. (Col. 6, ll. 43-54.) A slot 74 having side-walls 76, 78 is formed within the bond layer and TBC (col. 6, ll. 54-55), and has a shape which is generally rectangular (col. 8, ll. 57-58). "Side-wall 78 is considered to be the 'downstream' wall (relative to combustion gas flow 65), and it provides an obstruction to the flow of the coolant air. As a result, the coolant is generally forced to spread laterally into the slot and along hot

surface 73 (i.e., surface 62 as-coated). The coolant thus stays in close contact with the hot surface." (Col. 7, ll. 4-10.) Bunker discloses a method of forming the slot in which the coolant air holes are plugged, followed by application of a mask. (*See* Col. 7, ll. 14-49.) "The mask usually has dimensions which are substantially identical to the pre-selected dimensions of the slot." (Col. 7, ll. 49-52.) Coatings are then deposited on the substrate followed by mask removal. (Col. 8, ll. 29-30.) "The TBC is typically applied by a thermal spray technique, or by electron beam physical vapor deposition (EB-PVD)." (Col. 5, ll. 65-67.) "Removal of the mask effectively uncovers or 'produces' the slot at the exit site of the film cooling holes." (Col. 8, ll. 34-36.)

Having considered the claim language in light of the Specification, we see no basis for construing the claim limitations pertaining to the shape and position of the flow directors in a manner which would not encompass the two walls 76, 78 of Bunker's slot. The Specification indicates that the flow modifiers may have a rectangular shape and may be positioned upstream and downstream of the coolant holes, i.e., the shape and position of Bunker's slot walls 76, 78. To form the slot 74, Bunker deposits at least one layer on the surface of a component, shaping the layer based on a mask having predetermined dimensions corresponding to the holes. Appellants' Specification and claims indicate that the claimed depositing step may be effected using the same techniques used by Bunker.

As explained by the Examiner (Ans. 7-12), Appellants' remaining arguments are directed to limitations which are not found in the claims on appeal and, as such, are unpersuasive of error in the Examiner's rejections.

CONCLUSION

For the foregoing reasons, we affirm the decision of the Examiner to reject claims 1-24 and 27.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED

kmm

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
ONE RESEARCH CIRCLE
BLDG. K1-3A59
NISKAYUNA, NY 12309